



THE ATMOSPHERIC RESERVOIR

Examining the Atmosphere and Atmospheric Resource Management

Models, data point to a long wet cycle



The Devils Lake Basin has been hit especially hard by the current wet cycle.

By Bruce Boe

In a meeting hosted by the State Water Commission in Bismarck on March 16, climatic evidence and recent hydrologic model output were presented by Greg Wicke and Skip Vecchia of the U.S. Geological Survey, and Prof. Leon Osborne of the Regional Weather Information Center at the University of North Dakota. The ensuing discussion, which included Water Commission hydrologists and meteorologists, acknowledged some very sobering facts.

Prof. Osborne noted that since about 1977, the Pacific decadal oscillation (Pacific Ocean climate) has shown a change which has not reverted; a change which supports the idea that global climate shifted about that time to a pattern that has been wetter for North Dakota. He

added that his own studies show good evidence of 170-year cycles, cycles for which a physical linkage has not yet been established. Since about 1977 North Dakota has been wetter than average, a trend which he fully expects to continue. It was noted that the present La Niña (cooler than average Pacific Ocean equatorial sea surface temperatures), which had been fading, had again strengthened during the winter, but is now again weakening and is expected to wane by summer. This, he said, could have North Dakota returning to wetter conditions sometime later this month.

Though there are numerous other climatic cycles superimposed on the 170-year cycle, Leon believes that the overall summation of these cycles should leave North Dakota wetter than average until at least 2015.

Vecchia and Wicke presented results from a hydrologic model of the Devils Lake Basin, wherein precipitation totals from the last 20 years (1980-1999) were used to simulate future precipitation, which in turn was used to model future lake levels. The precipitation since 1980 was used because, since 1980, the annual Devils Lake precipitation has averaged just over 20 inches, whereas during the 1950-1979 period, it averaged only about 16.5 inches. This itself is striking evidence of the present wet cycle. In 10,000 simulations, using annual precipitation totals randomly from the last 20 years (the wet period), the elevation of Devils Lake exceeded 1,459 feet (the spill elevation) 180 times, or 1.8 percent. This indicates that if the current climatic conditions persist, there is about a 1 in 50 chance that the lake will spill naturally by year 2015. This is a much greater probability than had been previously thought. If an outlet is put in place to draw down the lake in a controlled way, the model shows that the odds of a natural, uncontrolled spill would be reduced to less than 1 percent, or less than a 1 in 100 chance.

While this kind of news isn't what eastern North Dakota is eager to hear, we need to be well informed as we make water resource management decisions. ■

Atmospheric Resource Board
North Dakota State Water Commission
900 East Boulevard, Bismarck, ND 58505
701) 328-2788
Internet: <http://www.swc.state.nd.us/ARB/>
ND Weather Modification Association
PO Box 2599, Bismarck, ND 58502
701) 223-4232